

# Peer effects on female soldiers' aspirations in the Norwegian Army

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# Abstract

This study is motivated by the effort of the Norwegian Government and the Norwegian Armed Forces to reduce the female flight from Army ranks and looks into peer effects among conscripts in gender mixed rooms in the Norwegian Army's Brigade North. The main research question is whether peers' exogenous attitudes affect female conscripts' preferences for working in the Armed Forces post military service.

The study benefits from of the natural experiment of random room assignment of soldiers to gender mixed rooms where male and female soldiers cohabitate. It avoids the potential reflection problem in the study of peer effects by focusing exclusively on exogenous peer characteristics as the identification strategy; if peers' exogenous characteristics measured at enrolment have an effect on roommates' outcome after eight weeks of cohabiting in gender-mixed rooms. This is investigated by using extensive survey data from the Norwegian Defence Research Establishment (FFI) collected at enrolment and after eight weeks of basic training.

The regression results indicate that female soldiers' preferences are stable and that peer attitudes on gender equality in the Armed Forces do not have a large and significant impact on female soldiers' preferences for future service. Female soldiers that complete basic training are highly motivated and possibly unreceptive to peer influence in the short run. The female soldiers serving in Brigade North thus appear to have consistent preferences for service, which indicates that there are other factors than fellow soldiers' attitudes which influence their plans for a taking a job in the Armed Forces post military service.



# Preface

*“Thought is of the body, not detached from it” - Siri Hustvedt, 2014*

The writing of this thesis has indeed been a physical experience. Aching shoulders, grinding teeth and the growing and stretching of brain cells, with the occasional breakdown of said cells coinciding with STATA crashes. Still, so grateful for the privilege of an education.

First and foremost I want to thank my supervisor Andreas Kotsadam for including me in this exiting project with the Norwegian Defence Research Establishment (FFI), Norwegian Social Research (NOVA) and the Institute for Social Research (ISF), and for guiding me though the entire process. Your encouragement, help and general positive spirit have been invaluable.

Fellow students and friends, thank you for interesting discussions, a lot of laughs and long lunches. I would not have made it through without you.

To my brother-in-law Dag, thank you for proofreading.

Finally, my dearest Magnus, thank you for your support and patience throughout my student years.

Any remaining errors or weaknesses are my responsibility alone.

Oslo, January 2015

Ada Elisabeth Fuglset





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# 1 Introduction

In the mid-1980s Norway was one of the first countries in the world that adopted full occupational gender equality in its Armed Force, including close-combat positions and the submarine force (Værnø & Sveri, 1990). This has supported the international impression of Norway as a pioneer within societal gender equality, but contrasting evidence to this image has emerged and still exists; the Norwegian Armed Forces have difficulties in recruiting and retaining female personnel. In 2013, only 9,7 % of the military positions in the Armed Forces were occupied by women, a substantially lower number than in fellow NATO-countries USA (14,6 %), Canada (14,8 %) and France (15 %) (French Ministry of Defence, 2013; National Defence and Canadian Armed Forces, 2014; Norwegian Armed Forces, 2015; U.S. Department of Defence, 2012).

The Norwegian Government and the Norwegian Armed Forces consider the military's gender composition problematic. The recent white paper from the Norwegian Government to the Parliament (Meld. St. 14 (2012-2013)) describes the need for diversified personnel and competence in the Armed Forces in order to maintain operational effectiveness (Norwegian Ministry of Defence, 2013). Increasing the proportion of women in service is stated as imperative to achieve increased diversity; the goal is to have 20 % female personnel employed in military positions by 2020 (Strøm-Erichsen, 2013).

Norwegian women got the right to attend Officers' Candidate School in 1977, and in 1984 they were permitted to undergo initial military service (Norwegian Ministry of Defence, 1997). In 2013, the proportion of women in initial military service was around 13 %, and there has been a steady increase from 4,6 % in 2005 (Norwegian Armed Forces, 2015; Norwegian Ministry of Defence, 2007). During the last ten years several measures have been implemented in order to increase the proportion of women in uniform. Many of these have focused on retaining female officers in the Armed Forces, such as affirmative action policies at the Armed Forces educational institutions and special career development programs for female officers (Norwegian Ministry of Defence, 2007). However, there have also been measures specifically aimed at increasing the proportion of women in initial service.

The military service is the main recruitment base for the Norwegian Armed Forces. All male citizens are subject to conscription, whereas women have enlisted on a voluntary basis. Before enrolment into service the potential soldiers go through a two-staged selection process. From 2006 until 2010 this selection process was voluntary for women, but from 2010 it was made mandatory for all citizens at the age of 18 as a part of the effort of increasing the proportion of female soldiers. Preliminary evidence indicates that this measure has not significantly increased the proportion of women in service (Norwegian Ministry of Defence, 2013).

A measure perhaps more likely to succeed in increasing the share of female soldiers is the gender-neutral (general) conscription which was effective of January 1<sup>st</sup>, 2015. General conscription increases the recruitment base of the Armed Forces to include all men and women that are found eligible for service, which might lead to a larger influx of female service members. However, a question is whether they will stay in the Armed Forces after the initial service time is completed.

In addition to the recruitment challenge, the Norwegian Armed Forces has difficulties keeping female personnel in its ranks. The turnover is highest amongst lower-ranking women below the age of 30. According to Steder (2011), the reasons they give for quitting are 1) other career prospects, 2) personal preferences that are incompatible with a career in the Armed forces or 3) mistreatment from their work community. Sexual harassment is one example of this mistreatment, another is the female service members' experience that they are being pressured into acting and behaving according to a military culture that they are uncomfortable with (Steder, 2011).

The higher command levels of the Norwegian Armed Forces recognize that the military culture is an important reason for women leaving the Armed Forces. "Attitudes, behaviour and cultural barriers are probably the biggest obstacles for women's opportunities, and influences their interest, desire and opportunity to make a career in the Armed Forces." (Norwegian Armed Forces, 1999, p. 23; my translation.) The culture that is present in the Armed Forces can be described as hegemonic and values that resemble masculinity have precedence (Rones, 2013). Several studies of the Norwegian

and other countries' Armed Forces have concluded that this culture of hegemonic masculinity is a barrier for the integration of female service members (Rones, 2013). Kristiansen, Boe, Bakken, Skjæret, and Granlund's (2008) review of research addressing women in the Armed Forces finds that the military culture to a large degree excludes female service members. This is also confirmed by newer studies, among others Totland (2009) and Kristiansen, Boe, and Skjæret (2010). Strand and Stornæs (2012) find that female students at the Officer Candidate's School "probably as a strategy to get accepted, quickly acquire the attitude and behaviour that are more typical for young men" (p. 4). If the minority adapts and adheres to the majority's standards of behaviour and values, the argument of including minorities in the Armed Forces in order to increase diversity, and thereby operational effectiveness, loses its validity. If female service members quit their military careers prematurely due to peer pressure of adapting to a culture with which they are uncomfortable, the Armed Forces loses trained personnel and, consequently, operational effectiveness.

At enrolment in the Armed Forces the soldiers are introduced to a new culture, a new set of rules and informal do's and don'ts that describe what constitutes acceptable behaviour in the military (Kristiansen et al., 2010; Kristiansen & Steder, 2013). The soldiers are at this point strangers to each other; and it is reasonable to assume that they all are subject to the same exposure to military culture and behaviour from their superiors. There have been studies, as mentioned above, on how the military culture may be a barrier to the integration of female soldiers, and on the other hand, how exposure to female service members over time reduces the male majority's prejudices (Stevens & Gardner, 1987). However, there is no study that investigates how fellow soldiers *affect* their female colleagues' preferences for service. This thesis will therefore investigate if peers' individual characteristics can explain a potential change in female conscripts' motivation for working in the Armed Forces post military service from enrolment until the completion of the first eight weeks of military training. The hypothesis is that the preferences and motivation for a career in the Armed Forces are likely to be affected by the first months of exposure to the military culture and the experiences of the individual soldier in a group setting. Indeed, 90 % of all soldiers who quit the military do so during the first three months after enrolment and around 70 % of the soldiers who quit do so during the first month of service (Køber, forthcoming). If

fellow soldiers' attitudes are part of the reason why female soldiers change their preferences for a career in the Armed Forces from enrolment and during the first months of service, policy measures can be undertaken to increase the soldiers' gender awareness.

## **1.1 Status of knowledge**

The Norwegian Defence Research Establishment (FFI) has done extensive research on cohorts of soldiers undergoing compulsory military service since 2008. This research is based on the Norwegian Government's white paper to the Parliament (St. meld. 36 (2006-2007)) on increasing the recruitment of women to the Armed Forces (Norwegian Ministry of Defence, 2007). The white paper emphasizes the need for research on cohorts' motivation for service and attitudes towards the military in order to map out why some choose to serve and others do not, and what causes women to quit the military. In addition, it is stated that there is a need for research on military culture in order to gain knowledge on the organisation's gender attitudes and to which extent the military culture facilitates women's careers, and if women experience pressure to change their behaviour in order to feel that they belong in the Armed Forces (Norwegian Ministry of Defence, 2007).

The FFI project on cohorts in the Armed Forces has focused its studies on conscripts and students at the officer candidate schools; why they choose to serve, their motivation for future service after the completion of the compulsory military service, how the selection and socialisation processes and military culture affects the individual, and finally why so many women choose to quit at an early stage in their military career (Steder, 2013). As a part of this research, Lauritzen and Batt-Rawden (2013) have looked into female soldiers' wellbeing and motivation for service. Their study is qualitative and based on interviews with thirty female soldiers, where twenty of the respondents were in the completion phase of their service time and ten had quit during the time of service. They found that there were various reasons why the women had applied for and started their military service. Some had a clear objective of a pursuing a career; others wanted to try something different for a year. The social environment and being part of a community were motivating factors for the female soldiers during the

military service, and most of them stated that they were content with the service. Some of the respondents stated that sharing rooms, so called gender-mixed rooms, with the male soldiers at the barracks was important to be fully included in the group. In response to the question of whether they would continue in the Armed Forces after the military service was done, the respondents' responses were diverse. It was not clear that having a good experience of the military service lead to them to wanting to continue in the Armed Forces after the initial service is completed (Lauritzen & Batt-Rawden, 2013).

## **1.2 Mixed rooms in the Norwegian Army**

Gender-mixed rooms (mixed rooms) are increasingly used throughout the Norwegian Army in order to facilitate the integration of female soldiers in the units. The policy has caused a great deal of international attention, a google search on gender mixed or unisex room and the Norwegian Armed Forces generates countless of news articles from all over the world, which all express a general astonishment over the arrangement itself and the soldiers and officers' contentment with it. However, to some of the units in the Norwegian Army, mixed rooms are old news.

The Norwegian Border Guard in Finnmark was the first army unit that adopted mixed rooms. As the Border Guard operates in small teams in remote areas, it is crucial that both male and female soldiers are accepted as equally important parts of the team. When serving at the remote border points, the soldiers have always shared rooms, and in 2008 the unit started to employ mixed rooms during the training period in the garrison as well, at the soldiers' request. Mixed sleeping facilities are now standard norm in the Border Guard, but the soldiers share rooms with the opposite gender on a voluntary basis. The mixed room arrangement is evaluated every sixth months through a questionnaire given to the female soldiers (S. Larsen, personal correspondence, October 10<sup>th</sup>, 2014).

The use of mixed rooms was also initiated in the Medical Battalion in Brigade North in 2008. In 2010 the rest of the Brigade's seven battalions followed, and started to use mixed rooms as an optional arrangement of sleeping facilities. Mixed rooms is however

not standardized throughout the Brigade, and the battalion commanders are free to choose the sleeping arrangement that they see as most efficient in their unit (A. H. Samuelsen, personal correspondence, October 30<sup>th</sup>, 2014).

Lilleaas and Ellingsen (2014) have studied the mixed room arrangement in a case study of two different units in the Norwegian Armed Forces. They find that mixed rooms may decrease the presence of what they label as negative, sexualized masculinity, but emphasise the need for pro-active leadership in order to achieve the goals of better communication and integration of female soldiers in the units (Lilleaas & Ellingsen, 2014).

The Norwegian Defence Research Establishment (FFI), Norwegian Social Research (NOVA) and the Institute for Social Research (ISF) are currently studying the use of mixed rooms and its effect on soldiers' motivation, attitudes and wellbeing. The study's subjects are the conscripts in Brigade North and the project is the first quantitative study of this arrangement. This thesis benefits from of the survey data from the project and aims to give a special insight into female soldiers' aspirations and how these might be affected by roommates' attitudes.

The thesis has the following outline: Chapter 2 gives a short review of the economic theory of peer effects and previous studies. Chapter 3 describes the setting of the natural experiment, the data collection and summary statistics. Chapter 4 specifies the hypothesis, the regression model and the generation of the treatment variables. Chapter 5 presents the results of the regression analysis. Chapter 6 discuss the findings and the study's limitations. Chapter 7 concludes.



## **2 Studying social interactions and group dynamics in economics**

During the last 40 years the field of economics has developed its breadth. Manski (2000) states that the study of social interactions in economics is increasing, but that the field is flawed by a divergence between economic theory and empirical research. This hampers the policy relevance of this branch of economics and he therefore raises the need for a closer connection between the real world's social processes and the focus of the economists' research; with precise definitions of concepts, specific research questions and well-designed research experiments in controlled environments (Manski, 2000). When studying group dynamics this means that one should study groups where intragroup effects can be isolated and where the causal mechanism of the effect can be identified. Further, when tied to economic theory, the results of the studies should provide real world policy implications. This is the aim of this study and to relate it to existing theory and previous research, the following chapter lays out the framework and earlier, relevant studies of peer effects in economics.

### **2.1 Identifying and analysing peer effects**

Group dynamics are increasingly being studied in the field of economics and peer effects have been defined in numerous ways. Sacerdote (2011) describes these effects as “nearly any externality in which peers' backgrounds, current behaviour or outcomes affect an outcome” (p. 250). Manski (1993) writes that the term ‘peer effect’, amongst others, is used when describing endogenous social effects “wherein the propensity of an individual to behave in some way varies with the prevalence of that behaviour in some reference group containing the individual” (p. 531). Examples of peer effects can be that the individual start playing football because all his friends do it or that a student increases her study efforts because her study group in college consists of hard-working students (Sacerdote, 2011).

Peer effects can operate through numerous channels and it is challenging to identify the specific mechanism of the peer effect in question. In studying peer effects many economists have used a linear-in-means model where the effects work through the mean:

$$(2.1) \quad Y_i = \alpha + \beta_1 \bar{Y}_{-i} + \gamma_1 X_i + \gamma_2 \bar{X}_{-i} + \varepsilon_i$$

Here  $Y_i$  is the individual's outcome as a function of her peer's average outcome,  $\bar{Y}_{-i}$ , her own background characteristics,  $X_i$ , and her peers' average background characteristics,  $\bar{X}_{-i}$  (Sacerdote, 2011). This model formalizes three different types of social interactions; endogenous and contextual peer effects and correlated effects (Manski, 1993):

- *Endogenous effects*, measured by  $\beta_1$ , are present when the person's behaviour varies with the behaviour of the group.
- *Exogenous (contextual) effects*, measured by  $\gamma_2$ , are when the person's behaviour varies with the exogenous characteristics (background, attitudes) of the group members.
- *Correlated effects* are present when members of the same group behave in the same way because they have similar characteristics or are in similar institutional environments.

According to Manski (2000), "endogenous and contextual interactions express distinct ways that agents might be influenced by their social environments, while correlated effects express a non-social phenomenon" (p. 127). Endogenous effects show from the impact of peers' current behaviour or outcomes, whereas exogenous effects stem from peers' backgrounds (Manski, 1993).

There are two main problems in the identification of causal peer effects, self-selection and the so-called reflection problem (Manski 1993; Sacerdote 2011). The self-selection problem occurs when people form groups of their own choice. It is reasonable to assume that persons are drawn to those that have similar characteristics as themselves. Examples are how students with similar grade levels form study groups in college and

how groups of friends form in high school. In these groups there might be an exaggeration of peer effects, but these effects are not peer effects in the economic sense. They are merely reflecting the grouping of people who share similar traits and who, as a result of that, reinforce these characteristics in the group as a whole. The self-selection problem can be solved by studying peer effects in groups where members have been exogenously and randomly assigned, as done by, amongst others, Carrell, Fullerton, and West (2009), Kremer and Levy (2008), and Sacerdote (2001). Another solution is to control for fixed effects of the group members and the institution, for instance student and school fixed effects, and identify peer effects by looking at cohort variation within the institution (Sacerdote, 2011).

The reflection problem arises when investigating whether the average behaviour in a group influences the behaviour of the individuals in the group; the identification of endogenous peer effects (Manski, 1993). A challenge when studying endogenous effects is that they are creating multiple equilibria where the peers' outcomes affect each other back and forth, making it hard to isolate the direction of the effect. If we look at the example where two persons share a room at college and assume that they affect one another, it is nearly impossible to think of an identifying mechanism that can separate the effects into one influencer and one recipient of influence. In addition, there is the fact that the mean behaviour of a group is determined by the behaviour of its members, so we cannot distinguish "whether group behaviour actually affects individual behaviour, or (if) group behaviour is simply the aggregation of individual behaviour" (Manski, 2000, p. 128). To be able to isolate the peer effect, Manski (1993) poses two necessary conditions; the researcher must know how the reference group is constructed, and the variables that define reference groups need to be moderately related to the variables that affect the individual's outcome directly. If they are "functionally dependent or statistically independent" (p. 532), identifying the peer effect is extremely challenging (Manski, 1993).

Several researchers have proposed solutions to the reflection problem. Manski (1993) highlights the need for richer data sets which include both people's actual behaviour and their statements of the reasons for their behaviour. This information can be obtained in controlled experiments and through the collection of subjective data

(Manski, 1993). Angrist (2014) suggests using exogenous background characteristics as the identification method of peer effects. The researcher should then perform a clear separation between the subjects of study and the peers that are assumed to provide the causal effect on the subjects, in order to eliminate the links between the subjects' own characteristics and the peers' characteristics (Angrist, 2014). This separation of the study subjects from their peers will make it possible to identify exogenous peer effects, and Angrist's (2014) 'peers - individual'- approach is the method used for the analysis in this thesis. How the distinction between subjects and peers is done when generating the peer treatment variables is described in chapter 4, where the interested reader in addition will find an explanation on the potential reflection problem for the analysis of peer effects in mixed rooms.

## **2.2 Previous empirical research**

Economists have studied peer effects on educational outcomes and on social outcomes like binge drinking, crime, drug use and teenage pregnancy. Among these, peer effects in human capital accumulation have received the most attention, and there is a vast literature that gives a rather complex picture of the effects of group dynamics on the different levels of the educational system. Based on Sacerdote's (2011) review of previous studies of peer effect in education, it appears that whether one finds peer effects or not, to a large degree depends upon the institutional setting, which peer groups are examined, and on the modelling of the peer effects.

In the study of peer effects on academic achievement, many researchers have relied on random assignment of roommates in college, like Sacerdote (2001), or random assignment of soldiers to squadrons/platoons at military educational institutions, such as Carrell et al. (2009) and Carrell, Sacerdote, and West (2013), to control for self-selection. In his study of college roommates at Dartmouth University, Sacerdote (2001) finds significant, but limited, peer effects of roommates' exogenous characteristics on freshman year Grade Point Average (GPA). He finds that having a roommate that is in the top 25 % of the academic index has a positive effect on GPA for students in the top 25 % or bottom 25 % of the index, but no overall roommate peer effect. Carrell et al. (2013) have studied how peers affect each other's GPA on the US Air Force Academy

(USAFA). They find a difference in how peers affect the GPA of the fellow students depending on how the assignment to peer groups took place; hence the institutional setting matters for which peer effects are found and their significance. When Carrell et al. (2013) used random assignment to squadrons; they found that the low ability students benefitted significantly from being in groups with high ability students. However, when the peer groups were designed to achieve this, there was a negative and statistically significant effect for the low ability students of being in groups with high ability students, whereas there was a positive effect for the middle ability students as they were separated from the low ability students. To explain their results, the authors propose the mechanism of self-selection, where students separated into study groups that matched their own academic level (Carrell et al., 2013).

In contrast to the inconsistent results of how peers' academic characteristics affect fellow students or roommates' academic outcomes, several studies have shown that college peers' non-academic characteristics affect both "social outcomes", such as alcohol consumption or political views, and academic results. Campos, Heap, and de Leon (2013) find that peers affect individual political engagement. They take advantage of random assignment of freshman students into classes and use survey interviews to test whether political identification and engagement changes between two periods of time and if this is correlated with classmates' initial political orientation and engagement. Kremer and Levy (2008) use a random lottery assignment of roommates in college, and study how the roommates' pre-college drinking habits influence the GPA of their cohabitant. They find that male students' GPA is significantly reduced by having a roommate that drank frequently or occasionally in the year prior to college admission. In their study of ethnicity mixed rooms at university, Boisjoly, Duncan, Kremer, Levy, and Eccles (2006) find that white students that were randomly assigned African American roommates in their freshman year at college were more likely to have personal contact with members of other ethnic groups after their first year, and expressed more positive attitudes to affirmative action several years after college, than white students with white roommates. Boisjoly et al. (2006) explain this by roommates affecting each other's attitudes and intermediate behaviour.

A thorough review of the main findings and methods in studies of peer effects on both academic and non-academic outcomes can be found in Sacerdote's (2014) recent article "Experimental and Quasi-Experimental Analysis of Peer Effects: Two Steps Forward?", which also highlights the challenges of using the linear-in-means model in estimating peer effects. Nearly all of the studies listed above make use of the linear-in-means model, with limited or more elaborate extensions, and Sacerdote (2014) questions the use of the linear-in-means model due to its simplicity, as it does not provide an accurate description of the world.

Several researchers have addressed the problems of the linear-in-means model and the model is often extended. Bramoullé, Djebbari and Fortin (2009) criticise the basic assumption of the linear-in-means model that individuals interact in groups, and that they *only* are affected by the members of this specific group. According to Bramoullé et al. (2009) this basic assumption in the linear-in-means model is not representative of real life. They instead suggest studying social networks in order to identify peer effects, and claim that social network studies will provide a more comprehensive analysis as the datasets have richer information on persons' relationships, and thus provide clearer evidence on social effects (Bramoullé et al., 2009). Theoretically, Bramoullé et al. (2009) extend the linear-in-means model so that each individual has his own reference group consisting of multiple reference groups, a social network of friends' friends. By this analysis they are able to separate the endogenous and exogenous effects, but they are not able to overcome the issue of self-selection, which hampers their identification of endogenous effects from correlated effects.

In addition to Sacerdote (2014) and Bramoullé et al. (2009), the critique of the linear-in-means model is put forward by Angrist (2014), who questions whether earlier findings in reality are driven by common variances in outcomes and features of the modelling of the peer effects. Both Sacerdote (2014) and Angrist's (2014) critique agree with Manski's (2000) observation of the divergence between economic theory and empirical research, and all three highlight the challenge of constructing sound models that give a true reflection of real world issues.

Another important critique of earlier studies of peer effects, by amongst others Manski (2000) and Sacerdote (2011), is their failure to identify the mechanisms of the effects. Sacerdote (2011) states that most studies of peer effects have been unable to separate and identify the exogenous and endogenous peer effects because they only have one exogeneity factor; either fixed effects or exogenous shocks to the group composition. They therefore do not answer the question of whether the peer effects are endogenous or exogenous, which, according to Manski (2000), is important from a policy perspective. Manski (2000) uses an example of peer effects in human capital accumulation to highlight the policy implications of the different effects. He explains that a policy of providing extra tutoring to a selected group of high school students will have a different effect on the average achievement level of all the students at the high school, depending on the kind of peer effect, endogenous or exogenous, that is present. If there are endogenous effects, where individual outcome varies with the average achievement level, the students getting the extra tutoring will, through their improved achievement level, indirectly affect the level of the other students, thereby raising average achievement level, which again raises the individual's level and so on, constructing multiple equilibria. With endogenous peer effects, all students gain from the extra tutoring given to the few. If, however, it is peers' background characteristic, like their family's socio-economic status, which affects other students' achievements, we would not see the multiple equilibria effect of the extra tutoring, hence the imposed policy will have no effect via the channel of peer effects (Manski, 2000). Isolating which peer effect is present is therefore important if researchers are to give relevant policy recommendations based on their findings.

In addition to the discussion on endogenous and exogenous effects one can ask which peers constitute the relevant objects for the study of social effects on individuals. R. Stinebrickner and T. R. Stinebrickner (2006) propose the following three reasons for the disappointing results of earlier studies' attempts of identifying peer effects on college students' academic outcomes: 1) Previous studies have focused on students that might be unreceptive to peer influence, 2) it is not clear that the peer the researchers think is the influencer, the randomly assigned roommate, actually is influencing the study subject, and 3) that the studies have been unable to identify the characteristics of roommates that are linked to peer quality in the context they are studying. According to

R. Stinebrickner and T. R. Stinebrickner (2006), these three points could explain the limited results in the Sacerdote (2001) study of peer effects of roommates at Dartmouth College: Firstly, Dartmouth is a highly selective school, where students are of high quality and maybe not receptive of peer influence. Secondly, the roommate assignment at Dartmouth might actually cause the roommates to interact more with other peers, as also was proposed in Carrell et al. (2013) study of USAFA, meaning that roommates might not be the relevant peer group to study. Lastly, if it is higher ability, and not diligent study habits, that explains one roommate's higher GPA; we will not necessarily see a strong relationship between GPA and the observable characteristics of the roommate, and consequently, there will be no peer effect (R. Stinebrickner & T. R. Stinebrickner, 2006).

As R. Stinebrickner and T.R. Stinebrickner's (2006) three discussion points are highly relevant also for studies of peer effects in the Armed Forces, their critique is considered in the review of studies of peer effects at the educational institutions of the U.S. Military in the next section.

## **2.3 Peer effects in the Armed Forces**

The Armed Forces provides a unique research area for the study of social interactions. This is especially true for the study of Norwegian conscripts undergoing military service. In their first months of service the soldiers live under strict rules and strong unit cohesion measures, often located in isolated places far away from family and friends. Despite this favourable institutional setting, there is no earlier study of peer effects in the Norwegian Armed Forces.

There are, however, studies on peer effects at the educational institutions of the U.S. Military. Carrell et al. (2009) study peer effects amongst freshmen at the U.S. Air Force Academy (USAFA), and Lyle (2007) studies peer and role model effects amongst freshmen at the U.S. Military Academy (West Point). Carrell et al. (2009) benefits from random assignment of new cadets into peer groups (squadrons), who live, eat and take classes together, and where there is limited interaction with cadets in other squadrons. The random assignment rules out the questions of self-selection of peers, which is one



of the main problems in studying peer effects. They find limited roommate peer effects, but large and significant peer effect within the squadron, of peers' exogenous pre-treatment academic characteristics on individual academic outcome (Carrell et al., 2009).

Lyle's (2007) study of West Point cadets benefits from many of the same institutional traits of the Military Academy as Carrell et al. (2009), and finds that peer and role models' exogenous attitudes towards academic majors and military service have some influence on individual academic and career choices. Especially interesting, with regards to the present thesis' hypothesis of peer effects on female soldiers' aspirations, is Lyle's (2007) finding that a 10 percentage point increase in the share of peers that envisioned a military career, increased the chance that the individual cadet stayed in the military longer than the mandatory service, by 2, 5 percentage points. According to Lyle (2007) this indicates that peers' attitudes may influence the individual cadets' attitudes towards military service.

Lyle (2007) and Carrell et al.'s (2009) studies of peer effects at the US Military educational institutions benefits from a rather strict institutional environment, in which teamwork is encouraged, and explore peer effects in a setting where a high degree of self-selection has taken place, prior to the random assignment. Carrell et al. (2009) discuss whether the experimental setting is driving their results and claim that they would have expected much larger roommate peer effects if it is so that "military organizations were more affected by peer influence" (p. 455), than other intuitions.

Lyle (2007) and Carrell et al. (2009) have managed to overcome the critique of R. Stinebrickner and T.R. Stinebrickner (2006) regarding studying the students who actually benefit from peers, and they are able to separate the effect of different peer groups. They are also able to identify the correct peer groups that have an influence and the characteristics that are linked to peer quality. This is especially apparent for Lyle's (2007) identification of role models' influence on individuals' choice of academic major and peers' influencing future career choices.

The question of whether roommates constitute the relevant peer group of influence is highly relevant for this thesis as the analysis is based upon the effect of roommates' exogenous attitudes on female soldiers' preference change. As earlier studies find limited to no roommate peer effects, special consideration is given to the institutional traits of the natural experiment, including roommate assignment and roommates' relevance as peer group, which is described and discussed in chapter 3.1. Another relevant question is whether the female soldiers actually are receptive of peer influence, given the fact that they themselves voluntarily have chosen to serve and one might expect a stronger motivation among voluntary female soldiers than male, drafted, soldiers. This will be further discussed in chapter 6.

# 3 Data and experimental setting

The dataset of the following analysis is based upon survey data of the summer enrolment of conscripts of the Norwegian Army's Brigade North, originally 2257 soldiers. The survey data consists of questionnaires given at the time of enrolment in the army and after eight weeks of basic training. The answers to the questionnaires are linked together with data from the two-staged selection process in order to confirm demographic data and changes in motivation and preferences from the selection process until the end of basic training. This is made possible by giving each soldier a unique and anonymous id-number which connects the answers collected at the different points in time; selection stage one, selection stage two, enrolment and after basic training.

The complete longitudinal sample consists of 1476 soldiers, 72 % of the soldiers originally drafted from the selection process. There are several reasons why the longitudinal sample is smaller than the original drafted number of soldiers; around 10 % of the soldiers are demobilized during the basic training period and around 18 % of the soldiers answering on enrolment, did not answer the survey after basic training. Also, about 12 % of the soldiers who answered after basic training did not answer upon enrolment. Of the 1476 soldiers that did answer at both points in time, about 27 % of the male soldiers and 100% of the female soldiers were assigned to gender mixed rooms and these constitute the sample that the regression analysis is based upon.

## 3.1 The setting for the natural experiment<sup>1</sup>

The Brigade North enrolment took place at a military base in southern Norway the first weeks of August 2014. Eight of the Brigade's battalions had their own day for enrolment where the conscripts that were drafted met at the base for different medical check-ups

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<sup>1</sup> The description of the institutional setting and data collection are based on my personal observations from working as a research assistant during the collection phase of the FFI, IFS and NOVA research project.

and to answer the questionnaire. At the end of enrolment day the conscripts were sent to their designated battalion's location in Northern Norway to start their training.

The first eight weeks of military service is the basic training period (*"rekrutten"*), which is known for strict enforcement of military rules and regulation. During these eight weeks the soldiers are to wear their uniform 24/7 and are not allowed to sleep outside base. The first extended leave is normally granted after completion of the basic training period and because of the remote location of the bases, this means that the soldiers basically spend all their time with their roommates and fellow conscripts in the platoon. Most of the training in the first eight weeks takes place in platoon formation. Squads, which could be proposed as a relevant peer group to study, are used inconsistently in the various battalions during these eight weeks. Roommates are therefore the most coherent peer group to study in this setting. In addition, since this study is focusing on a feature of the policy of gender mixed rooms, studying other peer groups will not answer the research questions.

The strict, institutional setting of the basic training period gives a unique opportunity to study social interactions in a controlled environment over time. However, a necessary prerequisite for studying peer effects in this setting is random assignment of roommates in order to avoid self-selection into peer groups. Upon arrival on the battalions' bases in Northern Norway the conscripts were assigned to rooms by the commanding officers. Two of the battalions used a randomisation form provided by the researchers at FFI, and these battalions constitute the restricted sample in the analysis. That roommate assignment was random in the remaining six battalions is not confirmed. However, testing on the independent variables (described below) indicates as good as random roommate assignment in all eight battalions.

Assignment to gender mixed rooms was made on a voluntary basis with at least two of the least represented gender in each room. This could cause a potential bias if it was so that male soldiers with pro-equality attitudes were assigned to gender mixed rooms and male soldiers with negative attitudes were assigned to all-male rooms. However, t-testing of all my explanatory variables, and additional control variables, give no significant difference between the reported attitudes of the male soldiers assigned to a

gender mixed room and the attitudes of the ones assigned to all-male rooms. Regression of assignment to mixed rooms on my explanatory variables and additional control variables indicates that the soldiers indeed were as good as randomly assigned, see table 2.

**Table 1 Distribution of variables - males**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Positive to female platoon leaders</b>	1746	0.630	0.483	0	1
<b>Positive to female leaders high level</b>	1740	0.7	0.458	0	1
<b>Positive female leaders in military operations abroad</b>	1734	0.488	0.5	0	1
<b>Negative to gender diversity on team</b>	1738	0.165	0.371	0	1
<b>Gender equality not important</b>	1749	0.073	0.260	0	1
<b>Mother high education</b>	1735	0.622	0.485	0	1
<b>Father high education</b>	1735	0.751	0.433	0	1

**Table 2 Randomization test of room allocation - males**

VARIABLES	(1) All	(2) Restricted sample
Positive to female platoon leaders	0.031 (0.030)	0.053 (0.042)
Positive to female leaders high level	0.025 (0.031)	0.028 (0.044)
Positive female leaders in military operations abroad	-0.012 (0.029)	-0.043 (0.043)
Negative to gender diversity on team	0.014 (0.034)	-0.004 (0.045)
Gender equality not important	-0.003 (0.046)	-0.003 (0.064)
Mother high education	0.039 (0.037)	0.055 (0.053)
Father high education	-0.047 (0.041)	-0.034 (0.061)
Constant	0.278*** (0.034)	0.226*** (0.049)
Observations	1,456	658
R-squared	0.003	0.005
Individual controls	No	No

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 3.2 Data collection

The survey data was collected at two different points of time, at enrolment in the first two weeks of August 2014 (wave 1) and then after seven to eight weeks of basic training at the end of September 2014 (wave 2).

At enrolment the conscripts were together in groups of 25-50 soldiers and answered the survey in classrooms with researchers or research assistants present. Large groups of conscripts were split in two in order to avoid unrest and cooperation on answers, as the researchers experienced that the conscripts were more prone to talk when finding themselves in larger groups. In the classroom the conscripts were given an Internet link to the survey and primarily used their own mobile phones when answering. The conscripts were told that it was mandatory to stay in the room while the survey was conducted, but it was voluntary to participate. In order to avoid that they influenced each other's answers, the candidates were not allowed to talk to each other until everybody had finished answering.

After eight weeks, at the end of the basic training period, wave 2 of the survey was conducted at each battalion's base in Northern Norway. The conscripts answered the survey on their phones as previously, either in an assembly area or in their own rooms. The supervision of the respondents during the collection of the second wave was not as extensive as for wave 1, and soldiers were observed to discuss questions and answers to a larger degree than at enrolment. This could have an effect on the answers to sensitive questions about bullying or sexual harassment, but is unlikely to have an effect on the questions that constitute the dependent variables of this study; plan for future service and satisfaction with the Armed Forces. It is worth noting that the two battalions that used the randomisation form provided by FFI conducted the survey in the assembly areas under supervision of researchers and assistants, which strengthens the results found in the restricted sample compared to the sample as a whole.

### **3.3 Description of the data set and summary statistics**

The survey consists of two waves, both consisting of 50-60 questions with sub questions. There are between one to ten alternative responses to each question or a Likert scale in which the respondent is supposed to answer to which degree he or she agrees with the proposed sentence. In the survey there are questions on demographic and socioeconomic variables; motivation and satisfaction with the service; risk attitude, personal self-image, personality and gender roles; bullying and sexual harassment; social flexibility; political preferences and participation in religious activities, attitudes on questions of immigration and gender equality in society and in the military.

The following questions constitute the dependent variables in the analysis<sup>2</sup>:

1. Do you plan to continue serving after mandatory military service ends?
2. How likely is it that you want to apply for a job in the Armed Forces after completing military service?
3. I think I am physically and mentally fit for service in the Armed Forces.
4. I feel qualified for future service in the Armed Forces.
5. How would you characterize your overall level of wellbeing in the Armed Forces?
6. How do you like the room where you are living?

The dependent variables are chosen to reflect female soldiers' preferences for service (Q1-Q2) and other aspects that are important for this decision (Q3-Q6). Questions 1 to 4 were included in both waves of the survey, whereas questions 5 and 6 only were included in wave 2.

Question 1 is recoded to plan not to continue in order to facilitate the interpretation of the regression results as the response alternatives are 1=Yes, 2=Don't know and 3=No. Question 2 is left as it is, with response alternatives ranging from 1 to 7. Questions 3 and

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<sup>2</sup> The numbering reflects the order the questions are analyzed and not how they appeared in the survey. Q1 was originally q8, Q2 was originally q11, Q3 and Q4 were q9 and q10 in wave 1 and wave 2. Q5 and Q6 were q12 and q15 in wave 2 of the survey. All questions used in the analysis are listed both in their original Norwegian phrasing and translated to English, with response alternatives, in table A1 in the Appendix. For a complete overview of the survey questions, the interested reader is referred to the Norwegian Defense Research Establishment.

4 have response alternatives ranging from 1 to 4, question 5 have responses ranging from 1 to 5, and question 6; from 1 to 7. The summary statistics of the dependent variables can be found table 3.

**Table 3 Summary statistics dependent variables – females in mixed rooms<sup>3</sup>**

Variable	Obs	Mean	Std. Dev	Min	Max
<b>Planning not to continue t<sub>1</sub></b>	175	1.926	0.616	1	3
<b>Planning not to continue t<sub>2</sub></b>	175	2.04**	0.664	1	3
<b>Propensity to apply t<sub>1</sub></b>	176	4.045	1.43	1	7
<b>Propensity to apply t<sub>2</sub></b>	176	3.983	1.569	1	7
<b>Fit for service t<sub>1</sub></b>	175	1.674	0.041	1	4
<b>Fit for service t<sub>2</sub></b>	175	1.6	0.044	1	4
<b>Qualified for future service t<sub>1</sub></b>	174	1.777	0.046	1	4
<b>Qualified for future service t<sub>2</sub></b>	174	1.862	0.049	1	4
<b>Overall wellbeing in the Armed Forces at t<sub>2</sub></b>	175	1.497	0.669	1	5
<b>Satisfied with room t<sub>2</sub></b>	174	5.701	1.374	1	7

Of the dependent variables that are surveyed at two points of time, t-testing reveals that the only dependent variable with a significant difference (5%-level) between what female respondents answered at t<sub>1</sub> and t<sub>2</sub> is question 1; whether one plans to continue in the Armed Forces post military service or not. The mean differences in responses on the other three variables are not significantly different from t<sub>1</sub> to t<sub>2</sub>.

There are significant differences between what male and female respondents answer on the questions regarding planning not to continue (Q1) and probability to apply (Q2) at t<sub>1</sub> and t<sub>2</sub>. Female respondents are significantly more motivated for future service both at t<sub>1</sub> and t<sub>2</sub> than male respondents. Regarding how male and female respondents see themselves as mentally and physically fit (Q3) and qualified for future service (Q4), it is also so that female respondents have significantly higher mean values both at t<sub>1</sub> and t<sub>2</sub>. This holds for the sample as a whole, and if restricted to respondents living on mixed rooms. On the questions regarding wellbeing in the Armed Forces (Q5), female respondents significantly report a higher level of wellbeing than male respondents, both

<sup>3</sup> Dependent variables which have significant changes in mean values from t<sub>1</sub> to t<sub>2</sub> are indicated by asterisks for the respective level of significance (\*\*\*) p<0.01, \*\* p<0.05, \* p<0.1)



in the sample as a whole and if restricted to mixed rooms. There is no difference between how the male and female respondents answer regarding how they like the room they are living in (Q6).

The baseline treatment variables are the respondents' attitudes to female military leaders and gender equality from wave 1 (see table A1 in the appendix). The analysis uses all roommates' attitudes, but excludes the individual herself in order to truly isolate the effect of the reference group on individual outcome. In addition, the analysis isolates the effects of male roommates' attitudes, as there are significant differences between all and male respondents' answers in the survey. The three questions regarding gender and leadership in the Armed Forces were recoded such that they equal 1 if the respondent answered that men or women were equally apt to lead or women were better, and 0 if they answered that men was the preferable gender in the various leadership positions. Concerning the question of whether a team performs better if it consists of personnel of the same gender, the respondents answered on a scale from 1 to 7, where 1 signified strong disagreement and 7 was strongly agree. This question was recoded to negative to gender diversity on team equal to 1 if the respondents answered 5-7, and 0 otherwise. On the question whether it is important that men and women share housework equally, the respondents answered on a scale from strongly agree (1) to strongly disagree (5). The question was recoded to negative to gender equality equal to 1 if the respondents answered partly disagree and strongly disagree, and 0 otherwise. Table 4 to 7 describes the summary statistics for the explanatory variables for the sample as a whole (table 4), for all males (table 5), for all in mixed room (table 6) and males in mixed rooms (table 7).

**Table 4 Summary statistics explanatory variables - all at t<sub>1</sub>**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Positive to female platoon leaders</b>	2023	0.656	0.475	0	1
<b>Positive to female leaders high level</b>	2013	0.720	0.449	0	1
<b>Positive female leaders in military operations abroad</b>	2008	0.505	0.500	0	1
<b>Negative to gender diversity on team</b>	2013	0.146	0.353	0	1
<b>Gender equality not important</b>	2026	0.069	0.253	0	1

**Table 5 Summary statistics explanatory variables - all males at t<sub>1</sub><sup>4</sup>**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Positive to female platoon leaders</b>	1746	0.630***	0.483	0	1
<b>Positive to female leaders high level</b>	1740	0.7***	0.458	0	1
<b>Positive female leaders in military operations abroad</b>	1734	0.488***	0.500	0	1
<b>Negative to gender diversity on team</b>	1738	0.165***	0.371	0	1
<b>Gender equality not important</b>	1749	0.073*	0.260	0	1

**Table 6 Summary statistics explanatory variables - all in mixed rooms at t<sub>1</sub>**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Positive to female platoon leaders</b>	679	0.704	0.457	0	1
<b>Positive to female leaders high level</b>	674	0.766	0.424	0	1
<b>Positive female leaders in military operations abroad</b>	677	0.541	0.499	0	1
<b>Negative to gender diversity on team</b>	678	0.118	0.323	0	1
<b>Gender equality not important</b>	681	0.062	0.241	0	1

<sup>4</sup> Explanatory variables where there are significant differences between male and female respondents' mean answers are indicated by asterisks for the respective level of significance (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1)

**Table 7 Summary statistics explanatory variables - males in mixed rooms at t<sub>1</sub>**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Positive to female platoon leaders</b>	447	0.651***	0.477	0	1
<b>Positive to female leaders high level</b>	446	0.724***	0.447	0	1
<b>Positive female leaders in military operations abroad</b>	448	0.507***	0.501	0	1
<b>Negative to gender diversity on team</b>	448	0.165***	0.372	0	1
<b>Gender equality not important</b>	449	0.073*	0.261	0	1

T-testing shows that there is no significant difference between the attitudes of males assigned to mixed rooms compared to male respondents in the whole sample. However, there are significant differences between male and female respondents, where female respondents are significantly more positive to female leaders at all levels and to gender diversity on team (1% level), and less likely to answer that gender equality is not important (10% level). This is indicated by asterisks for the respective significance level in table 5 and 7.

In addition to dependent and explanatory variables, a variable describing assignment to gender mixed rooms is generated to be equal 1 if the total number of women is above 0 (and not missing) and there is it at least one man in the room. All-female rooms are not gender mixed and is thus left out of the analysis.

## 4 Hypothesis and regression model

The roommates in mixed rooms in Brigade North constitute close knit groups and come to view each other as family members (Hellum, forthcoming). It is therefore likely that roommates' attitudes will affect other roommates' outcome. The research hypothesis of this thesis is that female soldiers who have roommates with positive attitudes toward gender equality and female military leaders will be more motivated to continue in the Armed Forces than female soldiers that have roommates with negative attitudes. In addition, roommates' attitudes' effect on overall wellbeing and satisfaction with the Armed Forces and the room is analysed as this might have an indirect effect on motivation for future service.

The main three peer effects described in chapter 2.1 are endogenous, exogenous and correlated effects. In this setting the endogenous effects are when the individual soldier's behaviour varies with the behaviour of her roommates. This means that the individual response to the question of whether she is planning to continue in the Armed Forces post military service will be affected by how motivated her roommates are for future service at the time of the second wave of the survey. However, using the roommates' current outcome as a causal explanation of the individual's current outcome will not identify the true peer effect of the roommates on the individual as it is likely that they have been affecting each other back and forth. This reflection problem makes it impossible to isolate the peer effect using the endogenous identifier of roommates' current outcomes.

The exogenous interactions in this setting are when the individual's behaviour varies with the exogenous characteristics of the group members and it is these background characteristics, measured at enrolment, that are the baseline for the analysis. This exogenous identification strategy is chosen in order to avoid the reflection problem of the endogenous identification described above. The potential correlated effects, which in this setting can be that the roommates behave in the same way because they now are part of a system which forces a great deal of uniformity on its members, are mitigated

by the randomization of roommates at platoon level and using platoon fixed effects in the analysis.

## 4.1 Regression model

The following analysis utilizes the random assignment of roommates as described in chapter 3.1 and the standard linear-in-means regression model explained in chapter 2.1 (Sacerdote, 2011):

$$(4.1) \quad Y_{i2} = \alpha + \beta_1 \bar{Y}_{-i2} + \gamma_1 X_{i1} + \gamma_2 \bar{X}_{-i1} + \varepsilon_i$$

For this study, the regression is specified as follows:

$$(4.2) \quad Y_{i2} = \alpha + \varphi_1 Y_{i1} + \gamma_2 \bar{X}_{-i1} + \rho_i D_i + \varepsilon_i$$

Here  $Y_{i2}$  represents the dependent variables; the individual soldier's plans for future service, her own perception of whether she is qualified, and mentally and physically fit for service, and her satisfaction and wellbeing in the Armed Forces after eight weeks of service ( $t_2$ ), defined as a function of her answer,  $\varphi_1 Y_{i1}$ , at time  $t_1$  and her peers' average background characteristics,  $\bar{X}_{-i1}$ , at  $t_1$ .  $D_i$  is a dummy variable controlling for platoon fixed effects, which captures correlated effects of being in a similar institutional environment and exogenous shocks to the peer group at the platoon level. The endogenous effect  $\beta_1 \bar{Y}_{-i2}$  is left out of the regression as the analysis does not regress the individual's current outcome on her peers' current outcome. The individual's background characteristics are also not included in the regression as the aim is to isolate the effect of the roommates' background characteristics on the individual outcome. This is elaborated in chapter 4.2. Regression (4.2) is also regressed on females only, in order to isolate the effect of all other roommates on female roommates.

In addition to the ordinary linear-in-means regression, interaction variables are included in order to separate the effect on male and female roommates:

$$(4.3) \quad Y_{i2} = \alpha + \varphi_1 Y_{i1} + \varphi_2 (Y_{i1} \times F) + \gamma_2 \bar{X}_{-i1} + \gamma_3 (\bar{X}_{-i1} \times F) + \rho_i D_i + \rho_i (D_i \times F) + \varepsilon_i,$$

The final regression (4.4) uses only the share of male roommates' (j) means background characteristics effect on female roommates:

$$(4.4) \quad Y_{i2} = \alpha + \varphi_1 Y_{i1} + \gamma_2 \bar{X}_{j1} + \rho_i D_i + \varepsilon_i$$

All regressions are clustered at room level in order to account for room as the treatment level. Hence, the observations within rooms are not independent.

## 4.2 Treatment variables

$\bar{X}_{-i1}$  are the roommates' individual characteristics at  $t_1$ , and it is from these characteristics the peer effect treatment variables are generated. The peer effects variables are generated by first recoding each question into a dummy variable, as described in chapter 3.3. The following will describe how the peer effect variable of "attitudes to female platoon leaders" is generated. All the peer effect variables are generated using the same procedure outlined below.

When generating the treatment variable "positive to female platoon leaders" first a variable measuring the total value of the variable "positive to female platoon leaders", given that there are no missing values on the two variables female and room, is generated by room. This is done because the main research question is how roommates affect the female soldiers, hence all-male rooms are excluded and all values that cannot be linked to a distinct room number are removed. Next a variable that takes into account that someone in the room might have missing values on "positive to female platoon leaders" is generated, and then replaced, to avoid that the individual gets a missing value on the roommates' attitudes when in reality it is the individual that has a missing value on the variable herself. Furthermore, the peer treatment variable is generated by finding the mean value of "positive to female platoon leaders": taking the total value in room minus the individual's value and dividing this on the number of the people in the room minus one. Deducting the individual from generating the mean share variable is important in order to avoid including the individual's own background characteristics in the variable measuring how the roommates' background

characteristics affect her. This is the “-1-approach” proposed by Angrist (2014), which makes it possible to truly separate the individual from the peer group assumed to affect her. This mean share of “positive to female platoon leaders” of other roommates is the first main treatment variable.

In addition to this, gender specific shares of the peer treatment variable are generated by room. Here the mean values for each gender in the room are isolated, in order to investigate the effect of male roommates’ attitudes on female roommates’ outcomes. For finding the effect of male roommates’ attitudes, the first step is repeated, a variable measuring the total male value of the variable “positive to female platoon leader” in the room, given that male equals 1, that there are no missing values on the room variable, and that the room is mixed. Furthermore, missing values are replaced as previously. The variable is then generated by dividing the total male value on the number of males in the room, giving the mean share of “positive to female platoon leaders” of male roommates, which is the other main treatment variable in the analysis.

In the regression tables in chapter 5, mean share of other roommates’ attitudes are used in the regressions presented in columns 1-3 and 5-7. The effect of mean share of male roommates’ attitudes can be found in columns 4 and 8.

# 5 Regression results

This chapter goes through each of the dependent variables and explains the findings from the regression analysis.<sup>5</sup> The analysis uses both the entire sample of all mixed rooms and the subsample where it is confirmed that the battalions have used the randomization form provided by FFI. Further discussion and implication of the results can be found in chapter 6.

## 5.1 Preferences for future service

*Q1 Do you plan to continue serving after mandatory military service ends?*

On Q1 there is a significant difference between what female soldiers answered in wave 1 and wave 2 (see chapter 3.3). The mean answer changed from 1.93 to 2.04, meaning that the mean answer at  $t_2$  was close to “Don’t know” (note that this variable is discrete, ranging from 1 to 3). The change is significant on 5 %-level.

Regarding the explanatory variables it is evident that what the respondent answered at  $t_1$  holds the largest explanatory power and it is only in the restricted sample that one of the independent variables has significant effect on planning not to continue (table 8). There is a significant difference in on how male and female soldiers are affected by their roommates’ attitudes towards female leaders in military operations abroad (column 7), but there is no significant peer effect of roommates’ attitudes on female soldiers’ plans to continue in the Armed Forces (column 6). Other than this, none of the explanatory variables are significant for this dependent variable.

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<sup>5</sup> All analyses are performed in STATA13.



**Table 8 Peer effects of roommates' positive attitudes towards female leaders in military operations abroad on the individual's plans not to continue in the Armed Forces**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Females in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of mal peers on females in restricted sample
All roommates' attitudes at t <sub>1</sub>	0.017 (0.093)	0.043 (0.205)	0.026 (0.108)		0.140 (0.174)	-0.211 (0.341)	0.405** (0.186)	
Interaction female and all roommates' attitudes at t <sub>1</sub>			0.016 (0.227)				-0.617* (0.356)	
Planning not to continue at t <sub>1</sub>	0.684*** (0.033)	0.555*** (0.084)	0.722*** (0.041)	0.555*** (0.084)	0.704*** (0.060)	0.472** (0.215)	0.760*** (0.068)	0.484** (0.221)
Interaction female and planning not to continue at t <sub>1</sub>			-0.166* (0.097)				-0.288 (0.231)	
Male roommates' attitudes at t <sub>1</sub>				0.000 (0.194)				-0.267 (0.336)
Constant	0.621*** (0.091)	0.434*** (0.093)	0.539*** (0.114)	0.445*** (0.106)	0.677*** (0.194)	1.689*** (0.608)	-0.107 (0.195)	1.655** (0.614)
Observations	526	175	526	175	174	57	174	57
R-squared	0.448	0.414	0.492	0.414	0.451	0.381	0.511	0.382
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Q2 How likely is it that you want to apply for a job in the Armed Forces after completing military service?*

There is no significant difference between the female respondents' answers at t<sub>1</sub> and t<sub>2</sub> for Q2. However there is one statistically significant explanatory variable, "roommates' positive attitudes to female leaders in military operations abroad", which has a positive effect on female soldiers' propensity to apply for a job in the Armed Forces after military service, in the restricted sample (table 9, column 6). The response values on Q2 ranges from 1 to 7, where 1 is very unlikely and 7 is very likely, and the mean answer for females at t<sub>2</sub> is 3.983. The positive and statistically significant coefficient (5 %-level) of all roommates' attitudes increases female soldiers' propensity to apply for a job post military service from the mean by 1,134, to 5,117. Restricting to looking at male roommates' attitudes there is a larger effect, but this is only significant at 10 %-level (column 8). There is also a significant difference in how male and females are affected by their roommates' attitudes (column 5). Note, however, that this is one of the three

regressions of 240 regressions in the analysis where the explanatory variable has an effect on the dependent variable for females, so the results should be interpreted with caution.

**Table 9 Peer effects of roommates' positive attitudes towards female leaders in military operations abroad on the individual's propensity to apply for a job in the Armed Forces post service**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Females in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
All roommates' attitudes at $t_1$	-0.112 (0.191)	0.011 (0.456)	-0.195 (0.229)		-0.113 (0.344)	1.134** (0.555)	-0.740* (0.428)	
Interaction female & all roommates' attitudes at $t_1$			0.205 (0.533)				1.874** (0.721)	
Probability to apply at $t_1$	0.743*** (0.034)	0.704*** (0.075)	0.747*** (0.045)	0.703*** (0.075)	0.776*** (0.059)	0.770*** (0.111)	0.796*** (0.081)	0.805*** (0.131)
Interaction female & probability to apply at $t_1$			-0.043 (0.087)				-0.026 (0.145)	
Male roommates' attitudes at $t_1$				0.096 (0.483)				1.383* (0.696)
Constant	0.101 (0.180)	2.071*** (0.555)	0.144 (0.220)	2.047*** (0.562)	1.222*** (0.316)	0.893** (0.367)	1.111*** (0.353)	0.837 (0.499)
Observations	527	176	527	176	175	58	175	58
R-squared	0.525	0.527	0.544	0.527	0.522	0.606	0.560	0.612
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### *Q3 I think I am physically and mentally fit for service in the Armed Forces.*

There was no significant difference in the female respondents' answer from  $t_1$  to  $t_2$  on this question, and neither of the explanatory variables is statistically significant for this dependent variable.

### *Q4 I feel qualified for future service in the Armed Forces.*

There was no significant difference in the female respondents' answer from  $t_1$  to  $t_2$ . The only explanatory variable that proved significant was roommates' attitudes towards female leaders in military operations abroad (table 10). Here there is a significant difference in how male and female roommates are affected by their roommates'

attitudes in full sample (column 3), but there is no significant, isolated effect on female soldiers (column 2).

**Table 10 Peer effects of roommates' positive attitudes towards female leaders in military operations abroad on roommates' perception of whether they are qualified for future service in the Armed Forces**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Females in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
All roommates' attitudes at t <sub>1</sub>	0.321** (0.141)	-0.058 (0.243)	0.543*** (0.168)		0.263 (0.187)	-0.018 (0.408)	0.538** (0.259)	
Interaction female & all roommates' attitudes at t <sub>1</sub>			-0.601** (0.281)				-0.556 (0.513)	
Qualified at t <sub>1</sub>	0.399*** (0.057)	0.403*** (0.092)	0.435*** (0.069)	0.403*** (0.092)	0.444*** (0.094)	0.350** (0.142)	0.525*** (0.118)	0.355** (0.146)
Interaction female & qualified t <sub>1</sub>			-0.032 (0.104)				-0.175 (0.182)	
Male roommates' attitudes at t <sub>1</sub>				-0.096 (0.211)				-0.105 (0.346)
Constant	0.401*** (0.107)	0.611*** (0.099)	0.225* (0.128)	0.629*** (0.106)	0.215 (0.257)	0.956** (0.468)	0.260 (0.161)	0.962** (0.437)
Observations	524	174	524	174	173	57	173	57
R-squared	0.219	0.243	0.271	0.244	0.267	0.164	0.360	0.165
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5.2 Satisfaction with Norwegian Armed Forces and room

Question 5 and 6 were only included in the second wave of the survey. There is therefore no control variables of earlier perceptions included in the analysis.

*Q5 How would you characterize your overall level of wellbeing in the Armed Forces?*

As for question 4 there is only one significant explanatory variable; roommates' negative attitudes towards gender equality (table 11). Here there is a significant

difference in how male and female roommates are affected by their roommates' attitudes in the restricted sample (column 7), but there is no significant, isolated effect on female soldiers (column 6).

**Table 11 Peer effects of roommates' negative attitudes towards gender equality on roommates' overall wellbeing in the Armed Forces**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Female in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
All roommates' attitudes at t1	-0.189 (0.292)	0.143 (0.423)	-0.369 (0.475)		0.318 (0.457)	-0.671 (0.478)	0.975 (0.680)	
Interaction female & all roommates' attitudes at t <sub>1</sub>			0.512 (0.668)				-1.646* (0.853)	
Male roommates' attitudes at t <sub>1</sub>				-0.061 (0.379)				-0.382 (0.363)
Constant	2.000*** (0.000)	1.971*** (0.085)	1.000 (.)	2.015*** (0.095)	0.970*** (0.053)	1.000*** (0.000)	0.907*** (0.108)	1.000*** (0.000)
Observations	603	192	603	192	196	63	196	63
R-squared	0.059	0.152	0.125	0.151	0.053	0.134	0.099	0.128
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### *Q6 How do you like the room where you are living?*

There are three explanatory variables that prove significant for the question of whether the soldiers like the room their living on. First, there is a positive effect of roommates' positive attitudes towards female platoon leaders on female soldiers' contentment with room, in the restricted sample (table 12). This is valid both for looking at all roommates' attitudes (column 6) and restricting it to male roommates' attitudes (column 8). The coefficients are significant at 10 %-level. In addition, there is a significant difference in how male and female soldiers are affected by their roommates' attitudes, at the 5 %-level (column 7).

**Table 12 Peer effects of roommates' positive attitudes towards female platoon leaders on roommates' overall satisfaction with room**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Females in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
All roommates' attitudes at t <sub>1</sub>	0.084 (0.283)	0.524 (0.430)	-0.076 (0.354)		-0.136 (0.490)	1.164* (0.678)	-0.701 (0.621)	
Interaction female & all roommates' attitudes at t <sub>1</sub>			0.600 (0.506)				1.865** (0.807)	
Male roommates' attitudes at t <sub>1</sub>				0.484 (0.378)				1.189* (0.600)
Constant	5.916*** (0.283)	5.738*** (0.215)	6.076*** (0.354)	0.677*** (0.252)	5.058*** (0.212)	5.534*** (0.271)	5.300*** (0.274)	5.703*** (0.150)
Observations	600	190	600	190	195	62	195	62
R-squared	0.076	0.164	0.118	0.166	0.026	0.138	0.094	0.150
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Second, the explanatory variable of roommates' positive attitude towards female leaders on higher levels in the military system has a positive and significant effect (10 %-level) on female soldiers' contentment with room in the restricted sample (table 13, column 6).

**Table 13 Peer effects of roommates' positive attitudes towards female leaders on higher level on roommates' overall satisfaction with room**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Females in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
Roommates attitudes at t <sub>1</sub>	0.118 (0.311)	0.226 (0.603)	0.160 (0.395)		0.874 (0.539)	1.902* (1.086)	0.433 (0.786)	
Interaction female & roommates' attitudes at t <sub>1</sub>			0.066 (0.715)				1.468 (1.442)	
Male roommates' attitudes at t <sub>1</sub>				0.261 (0.541)				1.541 (0.981)
Constant	5.901*** (0.259)	0.830* (0.452)	5.867*** (0.329)	0.739 (0.541)	4.501*** (0.307)	5.239*** (0.435)	4.752*** (0.449)	5.076*** (0.589)
Observations	600	190	600	190	195	62	195	62
R-squared	0.076	0.159	0.116	0.159	0.043	0.177	0.101	0.154
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Third, the explanatory variable of roommates' negative attitudes towards gender equality has a different effect on male and female soldiers in the full sample (table 14, column 3), but this variable has no significant, isolated effect on female soldiers (column 2).

**Table 14 Peer effects of roommates' negative attitudes towards gender equality on roommates' overall satisfaction with room**

VARIABLES	(1) All	(2) Female	(3) Effect of others on males and females separately	(4) Effect of male peers on females	(5) Restricted sample	(6) Female in restricted sample	(7) Effect of others on males and females separately in restricted sample	(8) Effect of male peers on females in restricted sample
All roommates' attitudes at t <sub>1</sub>	1.032 (0.675)	-1.141 (1.326)	2.185*** (0.678)		1.393** (0.630)	2.106 (1.389)	0.731 (1.052)	
Interaction female & all roommates' attitudes at t <sub>1</sub>			-3.326** (1.436)				1.375 (2.003)	
Male roommates' attitudes at t <sub>1</sub>				-0.186 (1.184)				1.782 (1.137)
Constant	7.000*** (0.000)	6.000*** (0.000)	7.000*** (0.000)	6.000 (.)	4.867*** (0.145)	5.579*** (0.278)	4.930*** (0.140)	5.554*** (0.284)
Observations	600	190	600	190	195	62	195	62
R-squared	0.080	0.164	0.130	0.158	0.036	0.124	0.082	0.122
Platoon FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6 Discussion

Overall, the regression analyses presented in chapter 5 indicate that roommates' exogenous attitudes have little causal effect on the individual soldier's preferences for future service, whether she sees herself as fit and qualified for future service at  $t_2$ , individual level of wellbeing in the Armed Forces and how the soldier likes the room where she is living. Of 240 different regressions, only 7 provided significant results and even fewer provided evidence linked to the specific research question on peer effects on female soldiers' outcome. This study's results are therefore in line with other studies finding limited roommate peer effects, as Sacerdote (2001) and Carrell et al. (2009).

Given the design of the peer treatment variables, which eliminates the potential bias between peer characteristics and individual characteristics, the results are to be expected according to Angrist (2014), who is sceptical of large peer effects. Still, there are several aspects that should be highlighted that may explain the lack of peer effects on the variables of interest in this setting.

Only one of the dependent variables surveyed at two points in time had significant changes in mean answer. One explanation for this could be that the different female respondents' answers cancelled each other out. Another possible explanation is selective attrition, where the unmotivated female soldiers left the Armed Forces before wave 2 of the survey. This is further discussed in chapter 6.1. The most probable explanation is that the female soldiers' serving in Brigade North are highly motivated at enrolment and that this simply do not change during the basic training period. This is further discussed below.

An issue with the study is the time dimension and whether eight weeks of cohabitating is too short for roommates to have significant influence on each other's preferences. The lack of significant changes in the mean values of the dependent variables, except planning not to continue, indicates that the preferences for service and the perception of whether one is qualified and fit for service or not, are consistent, even when exposed to the hard training and stress of the basic training period and the strict rules and

regulations of the Armed Forces. Given the fact that the female soldiers serve voluntarily one might expect a stronger preference for future service among the female soldiers than the male, drafted soldiers, and this is indeed what was reported in chapter 3.3. The female soldiers' strong motivation at  $t_1$ , which mostly remains unchanged to  $t_2$ , might explain why there is little evidence for peer effects; perhaps the female soldiers are unreceptive of peer influence in the short run, holding consistent preferences for military service.

Another issue is whether there are other peer characteristics that have an effect on female roommates' preferences for service, other than peers' attitudes on female military leaders and gender diversity and equality. This cannot be ruled out, but given that female service members state incompatibility with the military culture as a reason for quitting (see page 2), it is interesting to investigate whether roommates' attitudes already at enrolment supported the masculine hegemony in the military culture and, if so, whether this influenced the female soldiers' negatively through the channel of peer effects. Clearly, this was not the case. Overall, 50 % of the male soldiers in mixed rooms were positive to female leaders in military operations abroad, 65 % were positive to female platoon leaders and 72 % were positive to female leaders on higher levels. Only 7 % were negative to gender equality and around 16 % were negative towards gender diversity on teams (see table 7, page 25).

The strength of this study is that it analyses peer effects within a favorable institutional framework, described in chapter 3.1, and that it focuses upon the effect of the mean of the roommates' characteristics in the room and not the effect of one single peer upon another. As in Lyle (2007), Campos et al. (2013) and Carrell et al. (2013), the study of *peer group* effects is likely a more realistic reflection of real world social interaction in contrast to studying pairs of college roommates (Sacerdote, 2001). A weakness of the study is that all the female soldiers in the longitudinal sample cohabit with male soldiers, which makes it impossible to detect a statistical difference between the preferences of female soldiers in mixed rooms compared with the ones living in all-female rooms. This study is therefore not able to assess the causal effect of cohabitating with male versus female soldiers on female soldiers' preferences for future service.



The study benefits from the natural experiment of random assignment of roommates to gender mixed rooms and survey data. As with all empirical studies, there are threats to internal and external validity. The following sub-chapters discuss the relevant issues in detail.

## **6.1 Threats to internal validity**

The main threats to the internal validity of this study are the potential failure of randomization of roommates and the possibility of attrition.

The random roommate assignment is tested by regressing the assignment of male respondents to gender mixed rooms on their exogenous characteristics surveyed at  $t_1$ , as described in chapter 3.1. There is no significant difference between the exogenous characteristics of men originally assigned to gender mixed rooms and men assigned to all-male rooms. However, a potential problem is the fact that some of the respondents reported to have switched rooms during the basic training period. The room numbers provided by the battalions reflect initial assignment, and hence, not where the respondents actually lived at different times of the basic training period if they changed rooms between wave 1 and 2 of the survey. The duration of the period of potential peer influence is therefore uncertain for the respondents that have reported to have switched rooms. Some of the respondents have also switched battalions during the first weeks of the basic training period. Where information exists on room and battalion switches, this is included, otherwise the assignment of soldiers to battalions and rooms are taken as given at enrolment date,  $t_1$ .

A possible explanation for the limited results could have been selective attrition whereby the less motivated females drop out of the sample between the waves. Indeed, the sample size is reduced from 234 in wave 1 to 175 in wave 2. However, selective attrition does not seem to have occurred, as it is not related to motivation and preferences for service at baseline. If anything, attrition is positively correlated with the propensity to apply for a job in the Armed Forces post military service, albeit only at a 10 % significance level.

Unfortunately, the data set does not provide information which makes it possible to distinguish whether the missing respondents have quit the Army or just did not want to answer the second wave. Whether the missing respondents lead to underestimation or biasedness of the peer effects will be speculative without this information, and so this discussion ends here.

## **6.2 Threats to external validity**

The main threat to the external validity of this study is the difference between the population studied and the population of interest.

Internally, looking at the Norwegian Armed Forces, it is reasonable to assume that the conscripts that are drafted from the same cohorts, and assigned to either the Army, the Air force or the Navy, do not have significantly different characteristics or motivations, other than differences in preference of military branch. As long as the female soldiers serve voluntarily it is reasonable to predict the same strong motivation and limited peer effect in mixed rooms also for female soldiers in the Air force and the Navy.

A more interesting question is whether the female soldiers currently serving are representative of their cohort at large. The Norwegian Parliament changed the law of conscription in October 2014 making conscription general, meaning gender-neutral. General conscription became effective on January 1<sup>st</sup>, 2015, with the first females being drafted and enrolled in the summer contingency of 2016. The female soldiers in this study have chosen to serve of their own will. With general conscription, all citizens found eligible are subject to military service if drafted. As it is still an untraditional choice for women to undergo military service it is reasonable to assume that the women currently serving have overcome obstacles and barriers prior to serving which might have strengthened their motivation. In addition, they have a high tolerance of the masculine jargon and traits of the military culture (Hellum, forthcoming). It is unlikely that the same level of tolerance and motivation will be found in the female cohort at large, given the public opinion of the Armed Forces as a masculine organisation. This study's findings will most likely not hold for the cohorts serving in the future and it would therefore be interesting to investigate potential peer effects in the cohort

enrolled in 2016, where female soldiers' preferences likely would be less consistent and uniform than today.

## 7 Concluding remarks

This study has looked into peer effects of randomly assigned roommates to gender mixed rooms in the Norwegian Army's Brigade North. Mixed room is a policy implemented in the Brigade at the request of the lower levels in the organisation in order to facilitate better integration of female soldiers into the units. The main objective of the study has been to investigate whether roommates' exogenous attitudes on female military leaders and gender equality have an impact on female soldiers' preferences for continuing their service in the Armed Forces post-military service.

The regression results indicate that female soldiers' preferences are stable and that peer attitudes on gender equality in the Armed Forces do not have a large and significant impact on female soldiers' preferences for future service. Female soldiers that complete basic training are highly motivated and possibly unreceptive to peer influence in the short run.

The limited findings of roommate peer effects in this study are in line with previous research of roommate peer effects. There is however reason to believe that the lack of large and causal effects is related to the female soldiers' strong motivation and preferences for service, which could be a feature of their voluntary enlisting. With general conscription in effect from the summer of 2016 there will likely be a more diverse group of female soldiers. Given this possibly increased diversity, a larger effect of roommates' attitudes and behaviour on female soldiers' preference for service could be expected. The recommendation is therefore that research on cohorts' motivation and preferences for service is maintained as the Norwegian Armed Forces continue its efforts for gender diversity in its ranks.

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# Appendix

**Table A1 Questions used in the analysis**

<b>Wave 1 &amp; 2</b>	
<b>Question</b>	<b>Response alternatives</b>
<p>Har du planer om å fortsette i Forsvaret etter førstegangstjenesten?</p> <p><i>Do you plan to continue serving after mandatory military service ends?</i></p>	<p>1) Ja 2) Vet ikke 3) Nei</p> <p>1) Yes 2) Don't know 3) No</p>
<p>Hvor sannsynlig er det at du vil søke om jobb i Forsvaret etter endt førstegangstjeneste?</p> <p><i>How likely is it that you want to apply for a job in the Armed Forces after completing military service?</i></p>	<p>Lite sannsynlig      2      3      4      5      6      Veldig sannsynlig</p> <p><i>Very unlikely      2      3      4      5      6      Very likely</i></p>
<p>Jeg tror jeg passer, både psykisk og fysisk, til å gjennomføre tjeneste i Forsvaret</p> <p><i>I think I am physically and mentally fit for service in the Armed Forces</i></p>	<p>1) Stemmer bra 2) Stemmer ganske bra 3) Stemmer ganske dårlig 4) Stemmer ikke i det hele tatt</p> <p>1) <i>Correct</i> 2) <i>More or less correct</i> 3) <i>Not very correct</i> 4) <i>Not at all correct</i></p>
<p>Jeg føler meg kvalifisert for fremtidig tjeneste i Forsvaret</p> <p><i>I feel qualified for future service in the Armed Forces</i></p>	<p>1) Helt enig 2) Delvis enig 3) Delvis uenig 4) Helt uenig</p> <p>1) <i>Agree</i> 2) <i>Partly agree</i> 3) <i>Partly disagree</i> 4) <i>Disagree</i></p>

Wave 1 only	
Question	Response alternatives
Hvilket kjønn tror du er flinkest i ledelse av tropp?  <i>Which gender makes the best platoon leaders?</i>	1) Menn 2) Like gode 3) Kvinner  1) <i>Men</i> 2) <i>Equally good</i> 3) <i>Women</i>
Hvilket kjønn tror du er flinkest i Forsvarets høyeste lederposisjoner?  <i>Which gender makes the best leaders in the highest rankings of the military?</i>	1) Menn 2) Like gode 3) Kvinner  1) <i>Men</i> 2) <i>Equally good</i> 3) <i>Women</i>
Hvilket kjønn tror du er flinkest i ledelse av militære operasjoner i utlandet?  <i>Which gender makes the best leaders in military operations abroad?</i>	1) Menn 2) Like gode 3) Kvinner  1) <i>Men</i> 2) <i>Equally good</i> 3) <i>Women</i>
Et lag presterer bedre når det består av samme kjønn  <i>A team performs better if it consists of personnel of the same gender</i>	Helt uenig      2      3      4      5      6      Helt enig  <i>Strongly disagree</i> 2      3      4      5      6 <i>Strongly agree</i>
Det er viktig at menn og kvinner deler husarbeidet likt  <i>It is important that men and women share housework equally</i>	1) Svært enig 2) Enig 3) Verken enig eller uenig 4) Uenig 5) Svært uenig  1) <i>Strongly agree</i> 2) <i>Agree</i> 3) <i>Neither agrees or disagrees</i> 4) <i>Partly disagree</i> 5) <i>Strongly disagree</i>

Wave 2 only							
Question	Response alternatives						
Alt i alt, hvordan trives du i Forsvaret?	Meget godt	Godt	Verken eller	Ganske dårlig	Meget dårlig		
<i>How would you characterize your overall level of wellbeing in the Armed Forces?</i>	<i>Very good</i>	<i>Good</i>	<i>Neither nor</i>	<i>Bad</i>	<i>Very bad</i>		
Hvor godt trives du på rommet der du bor?	Veldig dårlig	2	3	4	5	6	Veldig bra
<i>How do you like the room where you are living?</i>	Not at all	2	3	4	5	6	Very much